## (19) World Intellectual Property Organization

International Bureau





### (43) International Publication Date 14 August 2003 (14.08.2003)

### **PCT**

# (10) International Publication Number WO 2003/067504 A3

(51) International Patent Classification<sup>7</sup>: G06F 19/00

(21) International Application Number:

PCT/US2003/003006

(22) International Filing Date: 3 February 2003 (03.02.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/353,176 4 February 2002 (04.02.2002) US 60/421,772 29 October 2002 (29.10.2002) US

(71) Applicant (for all designated States except US): INGE-NUITY SYSTEMS, INC. [US/US]; 1565 Charleston Road, Mountain View, CA 94043 (US).

(72) Inventors; and

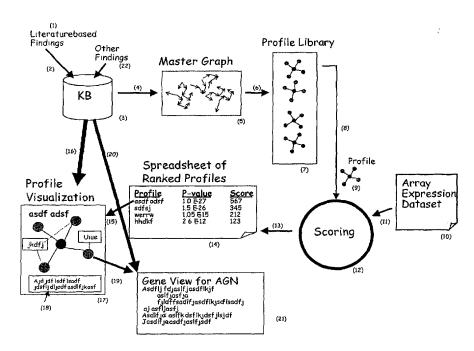
(75) Inventors/Applicants (for US only): CHEN, Richard, O. [US/US]; 4 Avocet Drive, Apt. 202, Redwood City, CA 94065 (US). CHO, Raymond, J. [US/US]; 1063 Morse Avenue, Apt. 13-202, Sunnyvale, CA 94089 (US). FELCIANO, Ramon, M. [US/US]; 3337 Brittan, Apt. 7, San

Carlos, CA 94070 (US). HOLLEY, Bret [US/US]; 500 E. 63rd Avenue, Apt. 15A, New York, NY 10021 (US). PATEL, Viresh [US/US]; 1326 48th Avenue, San Francisco, CA 94131 (US). RICHARDS, Daniel, R. [US/US]; 1661 Alma Street, Palo Alto, CA 94301 (US). SELVARAJAN, Sushma [IN/US]; 41 Crestline Drive, Apt. 2, San Francisco, CA 94131 (US). STEWARD, Keith [CA/US]; 5321 Gerine Blossom Drive, San Jose, CA 95123 (US). SCHNEIDER, Sara, Tanenbaum [US/US]; 765 Cottomwood Avenue, S. San Francisco, CA 94080 (US).

- (74) Agents: REED, James, L. et al.; Morgan, Lewis & Bockius LLP, 1111 Pennsylvania Avenue, NW, Washington, DC 20004 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

### (54) Title: DRUG DISCOVERY METHODS



(57) Abstract: Methods for identifying disease-related pathways that can used to identify drug discovery targets, to identify new uses for known drugs, to identify markers for drug response, and related purposes.

# WO 2003/067504 A3



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

### Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

# (88) Date of publication of the international search report: 30 September 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

ernational application No. PCT/US 03/03006

Box I Observations where certain claims were found unsearcha	ble (Continuation of item 1 of first sheet)
This International Search Report has not been established in respect of certain	claims under Article 17(2)(a) for the following reasons:
Claims Nos.:     because they relate to subject matter not required to be searched by t	his Authority, namely:
2. Claims Nos.: because they relate to parts of the International Application that do no an extent that no meaningful International Search can be carried out,	t comply with the prescribed requirements to such specifically:
Claims Nos.:     because they are dependent claims and are not drafted in accordance.	with the second and third sentences of Rule 6.4(a).
Box II Observations where unity of invention is lacking (Continu	ation of item 2 of first sheet)
This International Searching Authority found multiple inventions in this internation	onal application, as follows:
see additional sheet	
As all required additional search fees were timely paid by the applican searchable claims.	t, this International Search Report covers all
2. X As all searchable claims could be searched without effort justifying an of any additional fee.	additional fee, this Authority did not invite payment
3. As only some of the required additional search fees were timely paid to covers only those claims for which fees were paid, specifically claims	
4. No required additional search fees were timely paid by the applicant. (restricted to the invention first mentioned in the claims; it is covered by	Consequently, this International Search Report is relaims Nos.:
	arch fees were accompanied by the applicant's protest.  panied the payment of additional search fees.

# FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 26-44

Method for identifying drug targets

2. claims: 1-25, 45-53

Method for correlation of user data to pathways in a database

page 2 of 2

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G06F19/00

According to International Patent Classification (IPC) or to both national classification and IPC

#### B. FIELDS SEARCHED

 $\begin{array}{ll} \mbox{Minimum documentation searched (classification system followed by classification symbols)} \\ \mbox{IPC 7} & \mbox{G06F} \end{array}$ 

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	VAN HELDEN J ET AL: "Representing and analysing molecular and cellular function using the computer." BIOLOGICAL CHEMISTRY. 2000 SEP-OCT, vol. 381, no. 9-10, September 2000 (2000-09), pages 921-935, XP008032491 ISSN: 1431-6730 abstract; figures 1,4,5 page 921, right-hand column, paragraph 2 page 925, right-hand column, paragraph 3 - page 927, right-hand column, paragraph 1 page 930, right-hand column, paragraph 2-4 page 930, right-hand column, paragraph 6 - page 932, right-hand column, paragraph 3	1-7,13, 14, 18-25, 45-53

Further documents are listed in the continuation of box C.	Patent family members are listed in annex.	
Special categories of cited documents:      A' document defining the general state of the art which is not considered to be of particular relevance      E' earlier document but published on or after the international filing date      L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)      'O' document referring to an oral disclosure, use, exhibition or other means      P' document published prior to the international filing date but later than the priority date claimed	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone  *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.  *&* document member of the same patent family	
Date of the actual completion of the international search	Date of mailing of the international search report	
8 July 2004	22/07/2004	
Name and mailing address of the ISA  European Patent Office, P.B. 5818 Patentlaan 2	Authorized officer	
NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Türkeli, Y	

Interational Application No PCT/US 03/03006

0.00		PCT/US 03/03006			
C.(Continua Category °	(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT  ategory Citation of document, with indication, where appropriate, of the relevant passages    Relevant to claim No.				
	Original of document, with indication, where appropriate, or the relevant passages	Helevalle to claim No.			
X	EP 1 158 447 A (GMD GMBH) 28 November 2001 (2001-11-28)	1-6, 8-17, 20-44			
	abstract; figure 1 paragraphs '0008! - '0036! paragraphs '0072!, '0073!				
X	OLIVER DIANE E ET AL: "Ontology development for a pharmacogenetics knowledge base."  PACIFIC SYMPOSIUM ON BIOCOMPUTING. PACIFIC SYMPOSIUM ON BIOCOMPUTING. 2002, 'Online! 3 January 2002 (2002-01-03), pages 65-76, XP002287419  Retrieved from the Internet:  URL:http://helix-web.stanford.edu/psb02/oliver.pdf> 'retrieved on 2004-06-29!  abstract  page 65 - page 72	1-9,13, 14,18, 45-53			
X	KARP P D ET AL: "Integrated pathway-genome databases and their role in drug discovery." TRENDS IN BIOTECHNOLOGY. JUL 1999, vol. 17, no. 7, July 1999 (1999-07), pages 275-281, XP004169726 ISSN: 0167-7799 page 275, left-hand column, paragraph 1-4 page 278, right-hand column, paragraph 3 - page 280, right-hand column, paragraph 2	1-6, 47-53			
X	RZHETSKY A ET AL: "Poster: A knowledge model for analysis and simulation of regulatory networks in bioinformatics studies aiming at disease gene discovery" AMIA 99 FALL ANNUAL SYMPOSIUM, 'Online! 1999, pages 1-5, XP002287421 Retrieved from the Internet: URL:http://www.amia.org/pubs/proceedings/symposia/1999/D005314.pdf> 'retrieved on 2004-06-30! abstract; figure 1 page 1, left-hand column, paragraph 1 - page 2, right-hand column, paragraph 1 page 5, left-hand column, paragraph 1	1-7, 47-53			

Introducional Application No PCT/US 03/03006

	<del> </del>	PCT/US 03/03006
	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GOBLE C A ET AL: "TRANSPARENT ACCESS TO MULTIPLE BIOINFORMATICS INFORMATION SOURCES" IBM SYSTEMS JOURNAL, IBM CORP. ARMONK, NEW YORK, US, vol. 40, no. 2, 2001, pages 532-551, XP001116348 ISSN: 0018-8670 abstract; figure 1 page 533, right-hand column, paragraph 1 page 534, right-hand column, paragraph 1-3 page 536, left-hand column, paragraph 1- right-hand column, paragraph 3	1-7, 47-53
A	WO 01/55911 A (INFORMAX INC) 2 August 2001 (2001-08-02) abstract; figure 2 page 2, line 8 - page 7, line 24	1-53

Information on patent family members

Internal Application No PCT/US 03/03006

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 1158447	Α	28-11-2001	EP WO EP	1158447 A1 0136658 A2 1232280 A2	28-11-2001 25-05-2001 21-08-2002
WO 0155911	Α	02-08-2001	EP JP WO	1264249 A1 2003521071 T 0155911 A1	11-12-2002 08-07-2003 02-08-2001